

REMARKS

Claims 1-20 are pending in the application. Claims 1-10 and 12-20 are amended herein. The Applicant thanks the Examiner for the indication that claims 11-20 are allowed. The Applicant hereby requests further examination and reconsideration of the application in view of these Amendments and Remarks.

In paragraph 1 of the Office Action, the Examiner objected to the drawings since the features of claims 5 and 9 were not shown in the drawings. In response, the Applicant has amended FIGs. 1 and 5. FIG. 1 is amended to show a spreading profile select signal to show the corresponding feature of claim 9. The Applicant has amended FIG. 5 to include step 508, which suspends calculating divisor values if spreading is not enabled to show the corresponding feature of claim 5. Support for the amendments to FIGs. 1 and 5 may be found in the Applicant's original claims 9 and 5, respectively.

In paragraph 2 of the Office Action, the Examiner objected to the Specification since the features of claims 5 and 9 had insufficient antecedent basis within the disclosure and drawings. In response to the objection related to claim 5, the Applicant has amended the specification at page 8, lines 6-11, to add a description of step 508 in amended FIG. 5, which suspends calculating divisor values if spreading is not enabled. Support for the amendment may be found in the Applicant's original claim 5. In response to the objection related to claim 9, the Applicant has amended the specification at page 3, line 29, to page 4, line 12, to add a description of selecting one of a plurality of spreading profiles via the spreading profile select signal in amended FIG. 1. Support for the amendment may be found in the Applicant's original claim 9 and at page 10, lines 20-22, where the specification states that 1) the present invention may be extended to two or more spreading profiles, and 2) other embodiments of the present invention might allow for switching between spreading profiles.

In paragraph 3 of the Office Action, the Examiner objected to claims 4 and 6-8 for being of improper dependent form, and in paragraphs 9 and 10 rejected claims 4 and 6-8 under 35 U.S.C. § 101, since the language appears to overlap two statutory classes. In response to the rejection of claim 4, the Applicant has amended claim 4 to recite a first means for testing, a second means for adding, and a third means for subtracting to place the claim in proper apparatus form. In response to the rejection of claims 6-8, the Applicant has amended claim 6 to delete the "fractional accumulation method" and recite that the fractional divider is a phase accumulation fractional divider to place the claim in proper apparatus form. Claims 7 and 8 are amended as a result of the amendment to claim

6 to recite the phase accumulation fractional divider. Support for the amendment may be found in the Specification at page 6, line 10, to page 7, line 11, where the phase accumulation fractional divider is described.

In paragraph 4 of the Office Action, the Examiner objected to the term “The invention” recited in claims 2-10 and 12-20. The Applicant has amended claims 2-10 to recite “The signal generator circuit” and has amended claims 12-20 to recite “The method”.

In paragraphs 5-8 of the Office Action, the Examiner rejected claims 4 and 6-9 under 35 U.S.C. § 112. In response, the Applicant submits that the above amendments to claims 4 and 6-8, amendments to the Specification, amendments to the drawings, and corresponding remarks overcome the rejections to the claims under 35 U.S.C. § 112. Specifically, the spreading profile controller, as described in the Specification at page 4, lines 11-12, might be embodied as a form of processor or state machine, and as such might be configured with one or more modules (e.g., first, second and third means) to perform an algorithm in the digital domain. See Specification at page 10, line 32, to page 11, line 3. Thus, the limitations of claim 4, as shown in the exemplary block diagram of FIG. 5, might be implemented by a spreading profile controller embodied as a form of processor or state machine. Given a select signal, such as shown in FIG.1, the processor might select one of a plurality of spreading profiles. Similarly, the phase accumulation fractional divider of claim 6 is shown and described in FIG. 2 and accompanying text of the Specification, where the phase accumulation fractional divider might be implemented in accordance with the pseudo code described at page 6, line 19, to page 7, line 6.

In paragraphs 11 and 12 of the Office Action, the Examiner rejected claims 1-3, 9, and 10 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,559,698 to Miyabe (hereinafter “Miyabe”). In response, the Applicant’s amended claim 1 recites:

“a spreading profile controller adapted to calculate, in real time, a sequence of divisor values in accordance with a spreading profile characterized by a function; and a fractional divider dividing an output signal of the signal generator circuit by each of the divisor values in the sequence . . . , wherein the output signal of the signal generator circuit is generated without discontinuities in the varied frequency [emphasis added].”

Consequently, amended claim 1 recites that a fractional divider is employed to divide the output signal by each of the divisor values in the sequence generated in real time. See the Applicant's Specification, page 5, lines 3-29.

Miyabe, on the other hand, describes a spread spectrum type clock generating circuit (Miyabe, Title) that avoids a reduction in comparison frequency (i.e., a reduction of the feedback reference signal frequency, which feedback reference signal is based on the output of Miyabe's circuit) when the circuit is subjected to electromagnetic interference (EMI) (Miyabe, Abstract). Miyabe's divider (divider 15) is not a fractional divider, but rather varies timing signals during the comparison frequency cycles. Thus, Miyabe employs a basic division number set signal 23 generated from ROM 26, and then varies the basic division number slightly in accordance with a pattern. Varying the basic division number avoids reduction in comparison frequency causing cycle-to-cycle jitter in the presence of EMI. Specifically, Miyabe states at col. 6, lines 20-24 (and similarly at col. 6, lines 50-52):

“That is, fluctuation of +1.5% or 0.5% for the basic division number which cannot be produced otherwise (**since fraction division cannot otherwise be executed by divider 15 due to a deficiency in the number of bits**) is realized . . . [emphasis added].”

Miyabe's divider 15 includes a prescaler 15a to generate an intermediary divider signal 16 that, along with knowledge of main counter 15c's counter value, is used to generate a timing signal 18. The timing signal 18 is used to vary the update cycles used for the division (and reference frequency comparison). Miyabe's clock modulation circuit 2 includes delta-sigma modulator 21 that uses the timing signal 18 to generate quantization noise values of relatively high frequency. Based on the timing signal 18, Miyabe's clock modulation circuit 2 employs the output of delta-sigma modulator 21 to modulate the basic division number set signal 23 with the quantization noise of relatively high frequency. See Miyabe, col. 5, line 58, to col. 6, line 67. Thus, Miyabe does not describe or suggest a fractional divider dividing the output signal, but rather a divider that is operated so as to exhibit high-frequency update cycle fluctuations.

Elliot describes a circuit for generating an accurate measure of phase difference between two input signals, and does not describe or suggest using a fractional divider to divide the output signal based on a sequence of divisor values, as recited in the Applicant's amended claim 1.


Consequently, neither Miyabe nor Elliott, whether taken alone or in combination, describe or suggest a fractional divider to divide the output signal based on a sequence of divisor values in real time, as recited in the Applicant's amended claim 1.

For all these reasons, the Applicant submits that claim 1 is allowable over the cited references. Since claims 2-10 depend variously from claim 1, it is further submitted that those claims are also allowable over the cited references. The Applicant submits therefore that the rejections of claims under §§ 102(e) and 103(a) have been overcome.

In view of the above amendments and remarks, the Applicant believes that the pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

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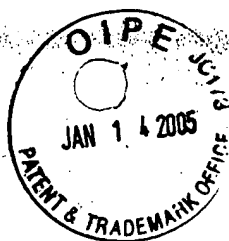
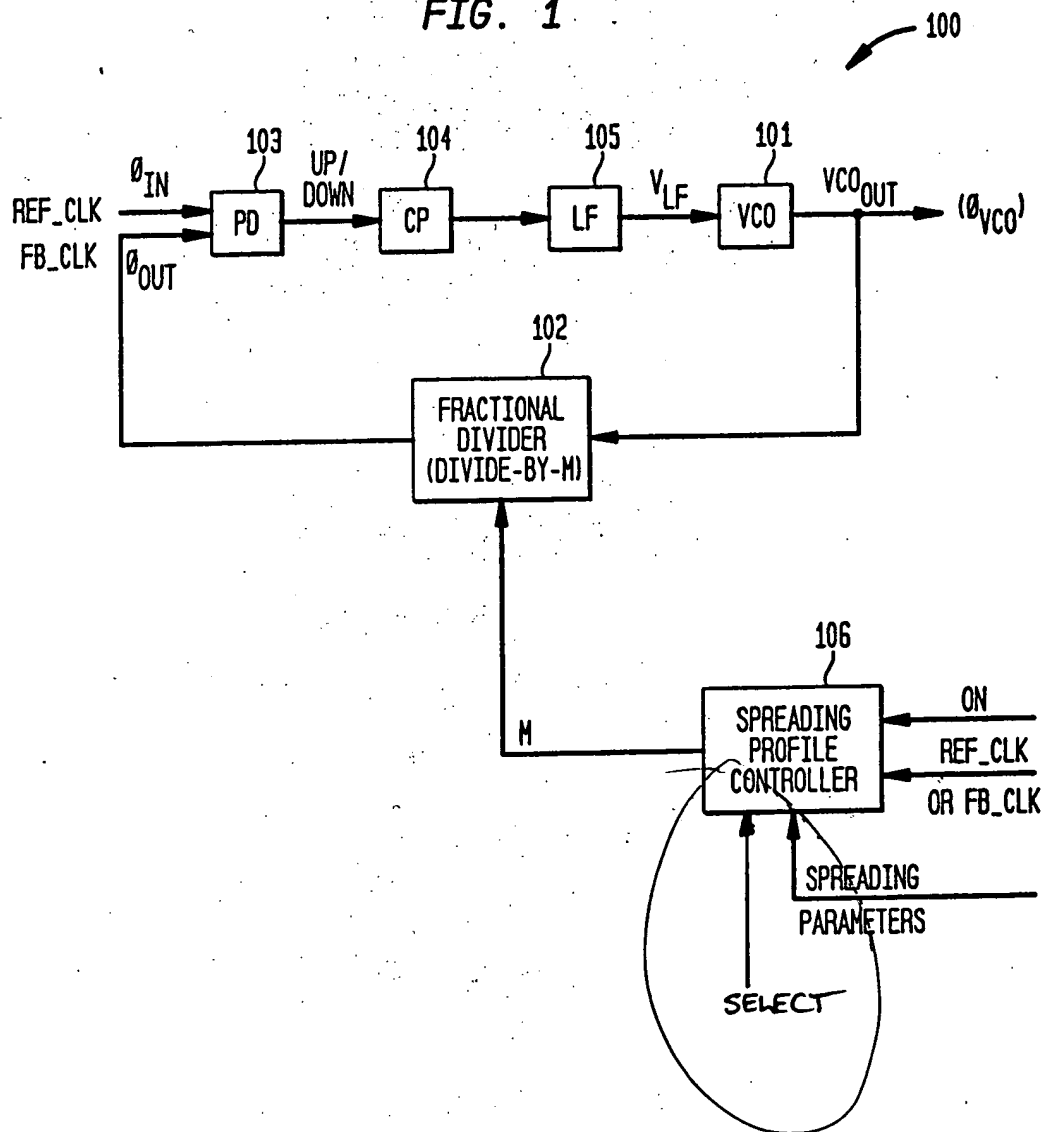
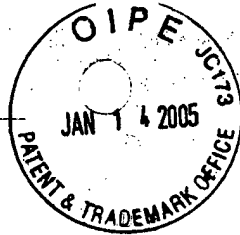


FIG. 1





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FIG. 5

